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**Title: SEMICONDUCTOR MULTICHIP MODULE PACKAGE WITH
IMPROVED THERMAL PERFORMANCE; REDUCED SIZE AND
IMPROVED MOISTURE RESISTANCE**

ABSTRACT OF THE DISCLOSURE

A multichip module has a substrate, which receives several flip chip and for other semiconductor die on one surface and has vias extending through the substrate from the flip chip bottom electrodes to solder ball electrodes on the bottom of the substrate. Passive components are also mounted on the top of the substrate and are connected to further vias which extend to respective ball contacts at the substrate bottom. In one embodiment, the bottom surfaces and electrodes of the die are insulated and their tops (and drain electrodes) are connected by a moldable conductive layer. In another embodiment the top surface of the substrate is covered by an insulation cap, which may be finned for improved thermal properties. The passives are upended to have their longest dimension perpendicular to the substrate surface and are between the fin valleys. The insulation cover is a cap which fits over the top of the substrate, with mold lock depressions contained in the junction between the cap peripheral interior edge and the substrate mating edge surfaces.